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2001P15526USPATENT APPLICATION
09/990,844

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CLAIMS

1. (Previously Presented) A method of reducing the number of path metric calculations in the trellis of a Viterbi equalizer receiving a sequence of symbols, the method comprising the steps of:

performing a preliminary decision of at least one of the previous symbols in the sequence of symbols;

identifying a subset of destination states which are excluded from path metric calculations and determining for each of the remaining destination states a survivor path by comparing all path metrics to this state;

determining the most likely of the survivor paths and determining the value of the oldest symbol in the symbol sequence from this survivor path; and

generating the trellis by calculating path metrics only for states in which the oldest symbol is identical to the determined value.

2. (Original) The method according to claim 1, wherein the sequence comprises n symbols and said previous symbols are a sub-sequence of $n-1$ symbols and said preliminary decision of at least one symbol comprises a sub-sequence of up to the last $n-2$ symbols.

3. (Original) The method according to claim 1, wherein said method is executed depending on the channel power distribution.

4. (Original) The method according to claim 1, wherein the sequence comprises n symbols and said previous symbols are a sub-sequence of $n-1$ symbols and said preliminary decision of at least one symbol comprises a sub-sequence of up to the last $n-2$ symbols and wherein the power distribution of said $n-2$ symbols is below a predefined threshold.

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5. (Currently Amended) A method of determining a reduced trellis from a sequence of symbols in a Viterbi detector comprising the steps of:

determining the symbol value of a previous symbol from the sequence of symbols; and
generating said reduced trellis by calculating only path metrics for states in which the previous symbol has the determined symbol value.

6. (Original) The method according to claim 5, wherein the step of determining comprises the steps of:

determining at least one symbol from a previous determination including a plurality of current states;

determining destination states for the determined symbol and determining a surviving path metric by comparing path metrics originating from the states of the determined symbol; and

determining the value of a previous symbol with respect to the determined symbol of the surviving state.

7. (Original) The method according to claim 6, wherein the previous symbol is the oldest symbol.

8. (Original) The method according to claim 6, wherein said sequence has n symbols and said previous determination includes a sub-sequence of $n-1$ symbols and said determination of at least one symbol comprises a sub-sequence of up to the last $n-2$ symbols.

9. (Original) The method according to claim 6, wherein said method is executed depending on power distribution of said sequence of symbols.

10. (Original) The method according to claim 9, wherein said sequence has n symbols and said previous determination includes a sub-sequence of $n-1$ symbols and said determination

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of at least one symbol comprises a sub-sequence of up to the last $n-2$ symbols and wherein the power distribution of said $n-2$ symbols is below a predefined threshold.

11. (Previously Presented) A tap-selectable Viterbi equalizer comprising:
means for determining at least one symbol from a previous determination assigned to a current state;
means for determining a destination state of a plurality of states and determining a surviving path metric by comparing path metrics originating from the determined symbol;
means for determining the value of a previous symbol with respect to the symbol of the surviving state;
calculating means for generating a reduced trellis by calculating only path metrics for states in which the previous symbol has the determined value.

12. (Original) The tap-selectable Viterbi equalizer according to claim 11, wherein said means for determining and said calculation means are implemented by a digital signal processor.

13. (Previously Presented) An arrangement for determining a trellis from a sequence of symbols comprising:

a plurality of equalizers receiving said sequence of symbols each generating a trellis, wherein said equalizers include a tap-selectable Viterbi equalizer;
a select unit for activating one of the equalizers, and
a control unit receiving said sequence of symbols and for determining a power distribution of said sequence of symbols and controlling said select unit depending on said power distribution,

wherein said tap-selectable equalizer comprises:

means for determining at least one symbol from a previous determination assigned to a current state;

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means for determining a destination state of said plurality of states and determining a surviving path metric by comparing path metrics originating from the determined symbol;

means for determining the value of a previous symbol with respect to the symbol of the surviving state; and

calculating means for generating a reduced trellis by calculating only path metrics for states in which the previous symbol has the determined value.

14. (Original) The arrangement according to claim 13, wherein said equalizers include: a Viterbi equalizer receiving said sequence of symbols generating a first trellis; and a tap-selectable Viterbi equalizer receiving said sequence of symbols generating a second trellis.

15. (Canceled)

16. (Previously Presented) The arrangement according to claim 13, further comprising a delayed decision feedback equalizer receiving said sequence of symbols generating a third trellis fed to said select unit.

17. (Original) The arrangement according to claim 13, wherein said equalizers include: a delayed decision feedback sequence estimator receiving said sequence of symbols generating a first trellis; and

a tap-selectable Viterbi equalizer receiving said sequence of symbols generating a second trellis.

18. (Original) The arrangement according to claim 13, wherein said equalizers include: a delayed decision feedback sequence estimator receiving said sequence of symbols generating a first trellis; and

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a Viterbi equalizer receiving said sequence of symbols generating a second trellis.

19. (Previously Presented) An arrangement for determining a trellis from a sequence of symbols comprising:

a plurality of equalizers capable of receiving said sequence of symbols and generating a trellis, said plurality of equalizers including a tap-selectable Viterbi equalizer;

a select unit for activating one of the equalizers, and

a control unit for determining an output from one of said plurality of equalizers receiving said sequence of symbols and for determining a power distribution of said sequence of symbols and controlling said select unit depending on said power distribution,

wherein said tap-selectable equalizer comprises:

means for determining at least one symbol from a previous determination assigned to a current state;

means for determining a destination state of said plurality of states and determining a surviving path metric by comparing path metrics originating from the determined symbol;

means for determining the value of a previous symbol with respect to the symbol of the surviving state; and

calculating means for generating a reduced trellis by calculating only path metrics for states in which the previous symbol has the determined value.

20. (Original) The arrangement according to claim 19, wherein:

said control unit determines which one of said plurality of equalizers will receive said sequence of symbols and generate a trellis to output.

21. (Original) The arrangement according to claim 19, wherein:

said control unit determines which one of the trellis generated by said plurality of equalizers receiving said sequence of symbols is output.